LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

INDIAN CREEK LAKE

WATERBODY EVALUATION &
RECOMMENDATIONS

CHRONOLOGY

March 2013 - Prepared by
Richard McGuffee, Biologist 3, District 3
Richard Moses, Biologist Manager, District 3

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WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Sportfish species, primarily largemouth bass (LMB) are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest adequate numbers of fish to maintain angler interest and efforts. Due to a high percentage (above 30%) of the largemouth bass population carrying the Florida genome the opportunity exists to catch preferred-size and trophy-size LMB in Indian Creek Lake.

Commercial

Indian Creek Lake does not support high numbers of commercial fish species. The clear, relatively infertile water is not conducive to the production of commercial fish species; therefore a commercial fisheries management strategy is not used.

Species of Special Concern

No threatened or endangered fish species are known to inhabit this waterbody.

EXISTING HARVEST REGULATIONS

Recreational

Statewide regulations for all fish species, the 2013 recreational fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/regulations

Commercial

The 2013 commercial fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/regulations

Rapides Parish Ordinance Article I, Section 19.5 -1. Rules and Regulations for Recreational Areas: Part B (4) b3. – prohibits the use of fishing nets, seines, slat traps or similar devices. The complete Rapides Parish Ordinance can be viewed at the following link. This regulation is a not a state law thus it cannot be enforced by the LDWF enforcement division personnel. It is enforced by the authority of the local Rapides Parish Sheriff's Office.
http://library.municode.com/index.aspx?clientId=10429

SPECIES EVALUATION

Recreational

Largemouth bass populations are targeted for assessment because they are a species indicative of the overall health of the fish population due to their high position in the food chain. Electrofishing is the most efficient sampling method for collecting largemouth bass to evaluate abundance and size distribution, with the exception of large bass. Gill net sampling is generally the preferred sampling method to determine the status of large bass and other large bodied fish species.

Largemouth Bass

Relative abundance and size structure indices-

Electrofishing has been used to collect largemouth bass population data in Indian Creek Lake since 1990. In Figure 1, springtime electrofishing results are used as an indicator of largemouth bass relative abundance in total catch per unit effort (CPUE). These results show the LMB catch per unit effort has increased considerably since 1990. In Figures 2 and 3, spring and fall electrofishing sample results are divided into stock-, quality-, and preferred-size classes. Since 1999, largemouth bass electrofishing results have indicated a sharp increase in all size classes of LMB. This may likely be attributed to the increase in complex cover in the lake due to the establishment of hydrilla. Hydrilla was discovered in the lake in the late 1990's and by 2002 it was growing out to the 12 foot contour.

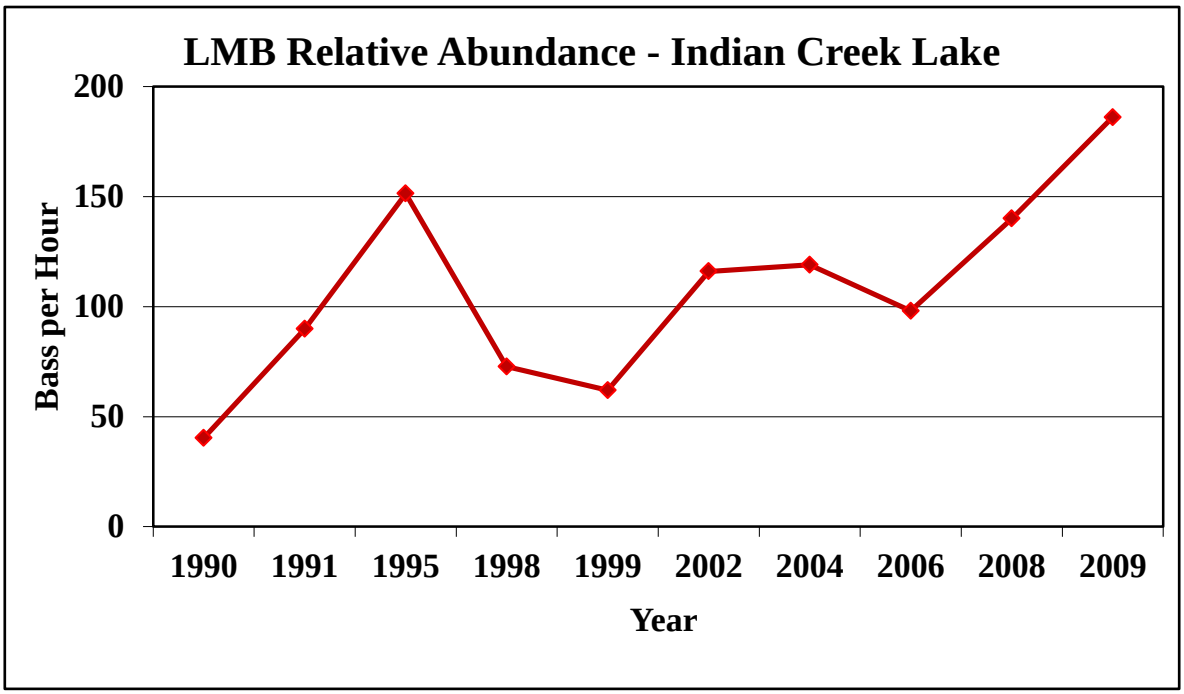

Figure 1. The total CPUE for largemouth bass from Indian Creek Lake, Louisiana for spring electrofishing results from 1990 - 2009.

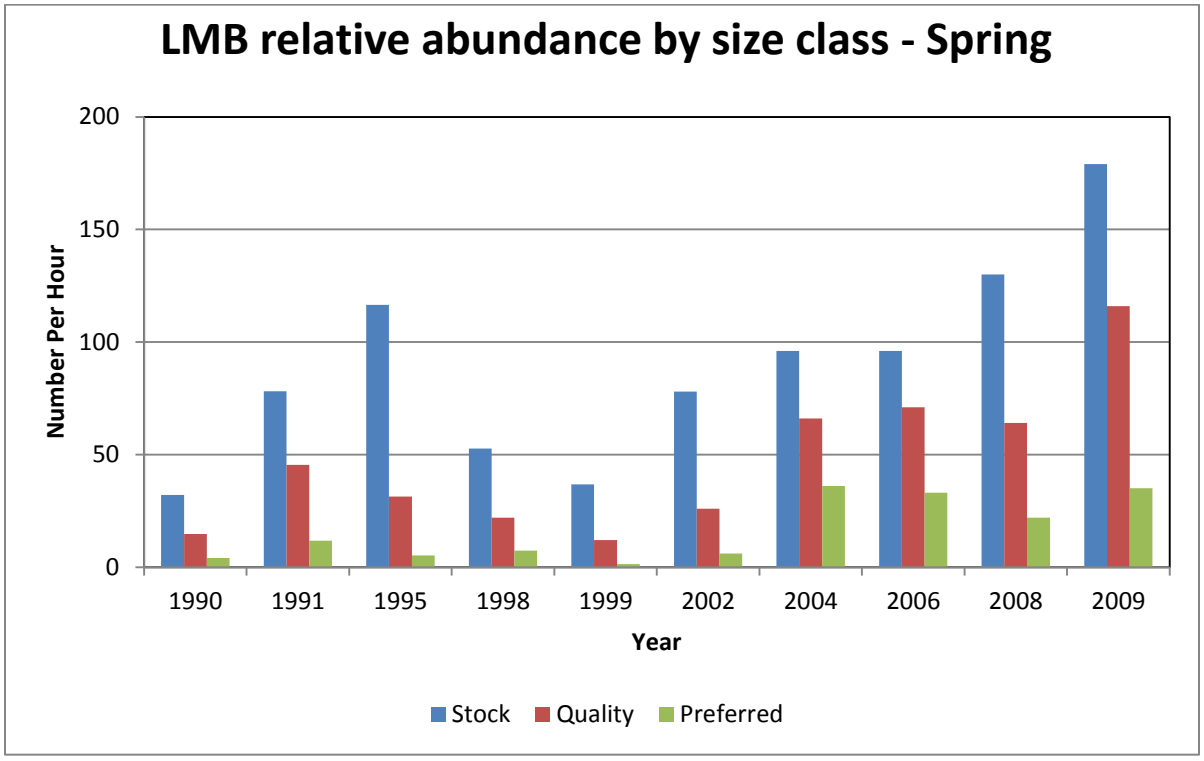

Figure 2. CPUE for stock-, quality- and preferred-size classes of largemouth bass on Indian Creek Lake, Louisiana for the spring season from 1990 - 2009.

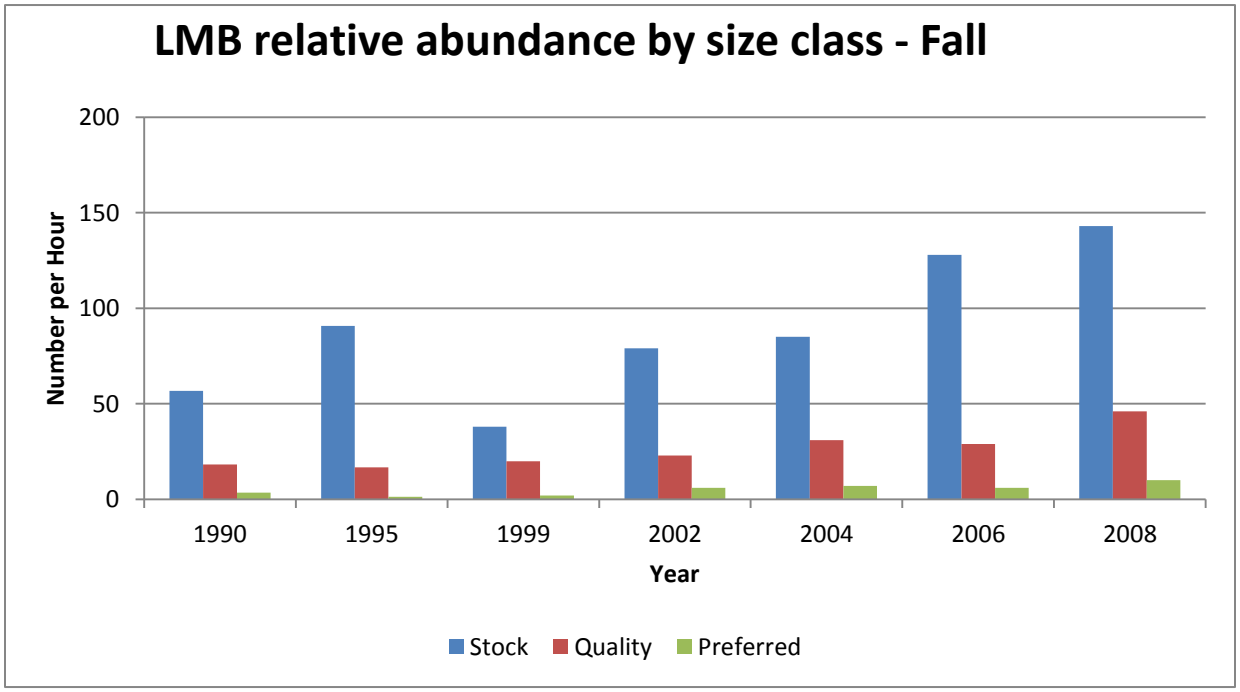

Figure 3. CPUE for stock-, quality- and preferred-size classes of largemouth bass on Indian Creek Lake, Louisiana for the fall season from 1990 through 2008.

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe LMB length-frequency data. Proportional stock density compares the number of fish of quality size (greater than 12 inches for largemouth bass) to the number of bass of stock size (8 inches in length). PSD is expressed as a percent. A fish population with a high PSD consists mainly of larger individuals, whereas a population with a low PSD consists mainly of smaller fish. For example, Figure 4 below indicates a PSD of 65 for 2009. The number indicates that 65% of the bass stock (fish over 8 inches) in the sample was at least 12 inches total length (TL) or longer. Individual lakes vary widely in their ability to support populations of bass; generally PSD's between 40 and 60 are considered good.

$$PSD = \frac{\text{Number of bass} > 12 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

Relative stock density (RSD) is the proportion of largemouth bass in a stock (fish over 8 inches) that are 15 inches or longer.

$$RSD = \frac{\text{Number of bass} > 15 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

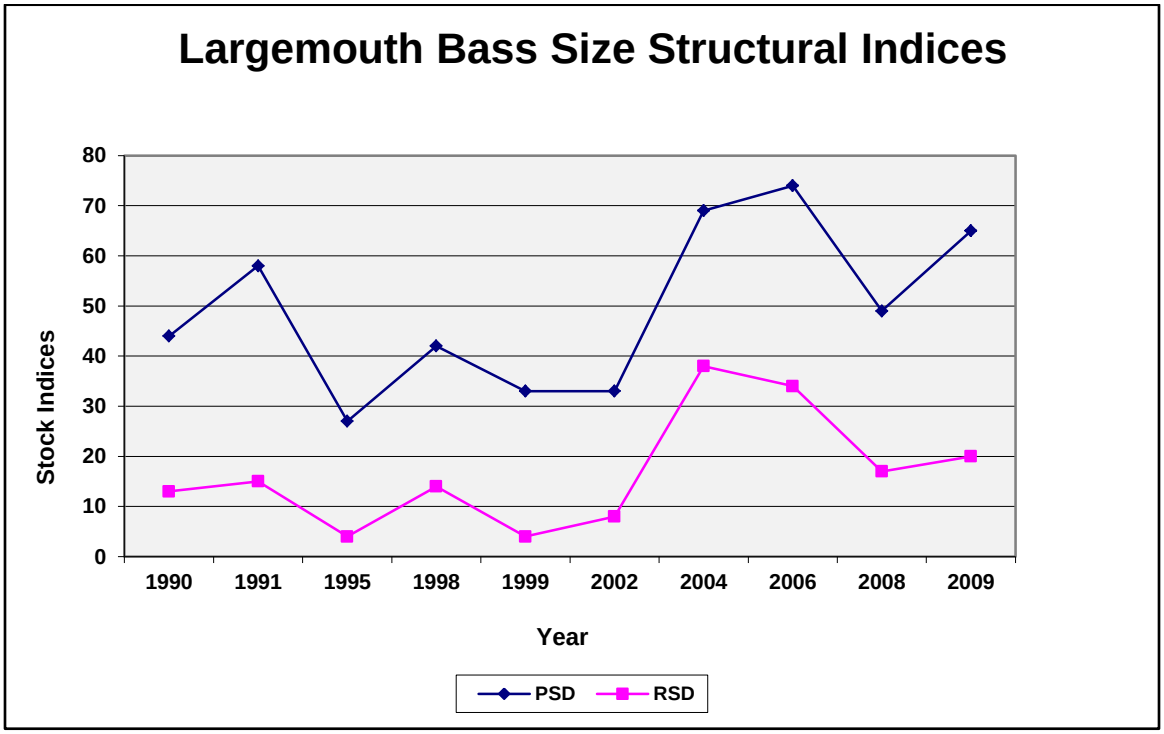

Figure 4. PSD and RSD-$_P$ largemouth bass collected from Indian Creek Lake, Louisiana for spring electrofishing samples from 1990-2009.

Trends in Indian Creek Lake sampling results indicate PSD's and RSD's have increased from 2002 through 2009.

Largemouth Bass Age and Growth-

The largemouth bass age structure for Indian Creek Lake was analyzed in 2006 and 2008 and results were similar for both years. The results for 2008 are found in Figure 5. The majority of the LMB were found to fall into age classes 0,1, and 2 with over 50% of the fish found to be age 1. Indian Creek bass growth rates were calculated in 1990. Growth rates for 1 and 2 year old bass were below the state average but growth rates reached the state average by age 3. Bass growth rates are found in Table 1. Indian Creek bass age structure and growth rates are similar to other bass populations found in lakes of central Louisiana.

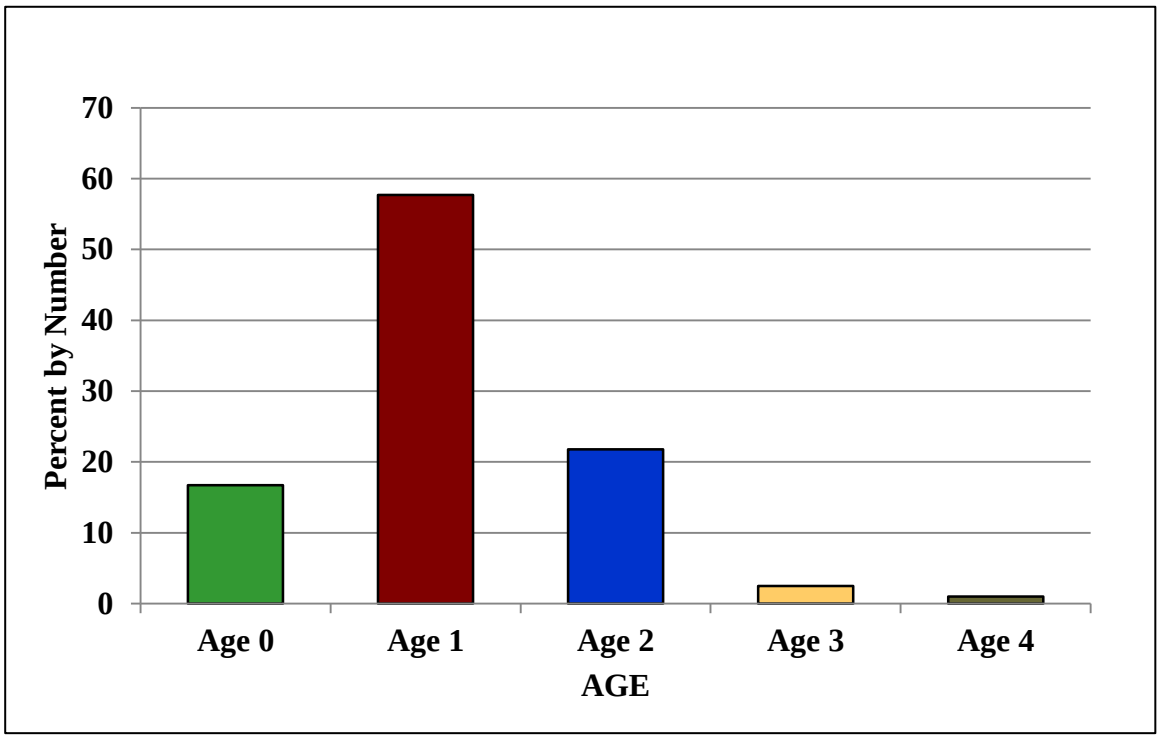

Figure 5. The age structure composition (percentage) for largemouth bass from Indian Creek Lake, Louisiana for 2008. N = 158.

Table 1. Average length at age of capture for largemouth bass in Indian Creek Lake, Louisiana 1990. N = 19.

AGE	Average Length (inches)
1	5.6
2	10.6
3	14.4
4	17.6
5	18.9
6	19.6

Forage

Forage availability is measured through two methods. These include summertime shoreline sampling with haul seines and fall forage electrofishing. Shoreline seining results can be found below in Figure 6. Predominate forage species included sunfishes, minnows, shiners and silversides. Forage availability is also measured indirectly through measurement of largemouth bass body condition or relative weight. Relative weight (Wr) is the ratio of a fish's weight to the weight of a "standard" fish of the same length. The index is calculated by dividing the weight of a fish by the standard weight for its length and multiplying the quotient by 100. Largemouth bass relative weights below 80 may indicate a potential problem with forage availability. The relative weights of LMB collected from Indian Creek Lake exceeded a value of 85 for all size groups, indicating an abundance of available forage. Relative weights can be found in Figure 7.

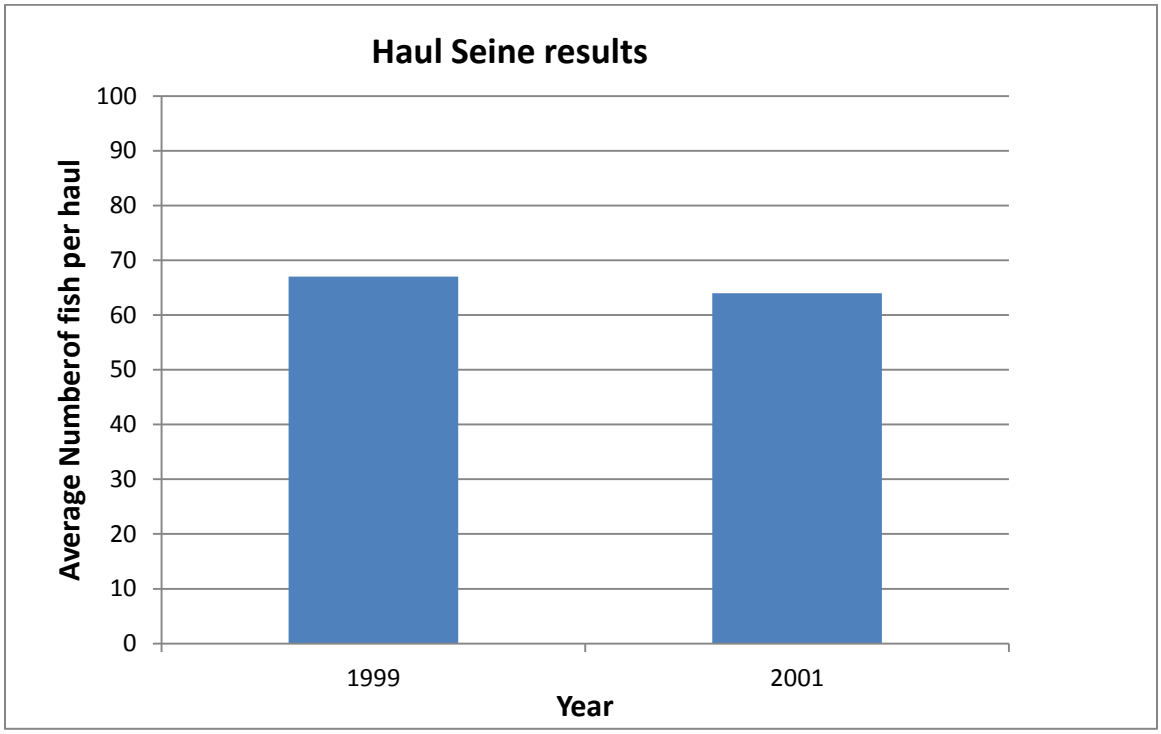

Figure 6. Average number of fish less than 6 inches TL (potential forage) captured per haul seine in Indian Creek Lake, Louisiana for the years 1999 and 2001.

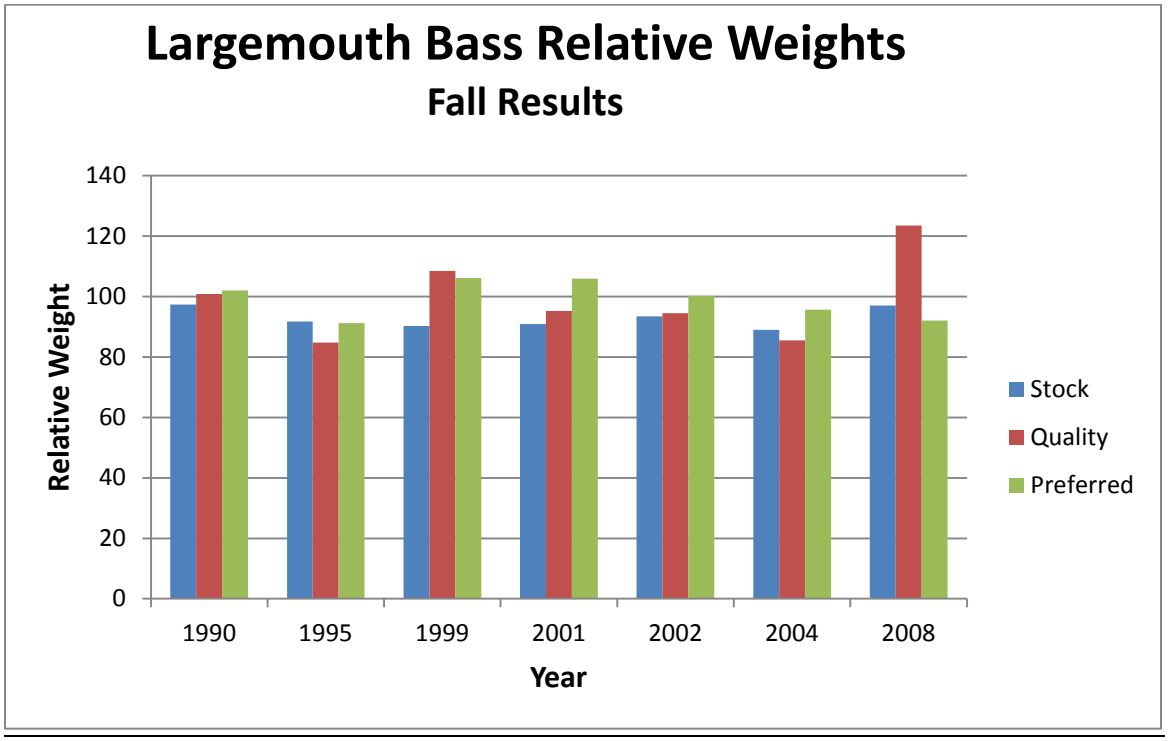

Figure 7. Relative weights for stock-, quality-, and preferred-size classes of largemouth bass collected during fall electrofishing for Indian Creek Lake, Louisiana from 1999 to 2008.

Largemouth bass genetics-

Florida largemouth bass (FLMB) stockings have been minimal in Indian Creek Lake. A small stocking of FLMB fry were introduced into the lake in 1995. A total of 49 adult FLMB were stocked in 2008 and 2009. Florida bass stocking has not occurred since 2009. However, incidental fish stockings do occur from the adjacent Booker Fowler Fish Hatchery which utilizes water from Indian Creek Lake for operational purposes. Lake water, after flowing through a series of fish fingerling production ponds at the hatchery is allowed to drain back into the lake. Genetic analysis of largemouth bass conducted in 2001, 2006, and 2008 found no less 30% of the fish tested contained Florida alleles. See Table 2 below for the complete genetic testing results.

Table 2. Largemouth bass genetic testing results for Indian Creek Lake, Louisiana.

Year	% NLMB	% FLMB	% FLMB x NLMB	Total FLMB Influence
2001	63	7	30	37
2006	52	10	38	48
2008	70	4	26	30

Crappie

Aquatic habitat in Indian Creek Lake is very conducive to the production of black crappies. No white crappies have been documented since 1979. Historical rotenone sampling results from 1979 through 1987 found low numbers of crappie (Table 3). Lead net sampling for crappie was conducted in Indian Creek in 2005 and 2007. Sample CPUE was low - with only six crappies collected in 2005 and 18 in 2007. However, this was at a time when LDWF was just beginning to utilize lead nets for crappie sampling, and gear deployment techniques and proficiency is questionable. Crappie fishermen do utilize the lake heavily during certain times of the year. Anecdotal reports suggest that the crappie population in Indian Creek is similar to other clear, infertile lakes of central Louisiana. Additional crappie population results are needed at this time.

Commercial

Large rough fish species that comprise a commercial fishery are not found in sufficient numbers to support a viable commercial fishery. Gill netting sampling found a small number of commercial species, primarily catfish. The quantity of each species was low. Gill netting results are depicted in Figure 9 below.

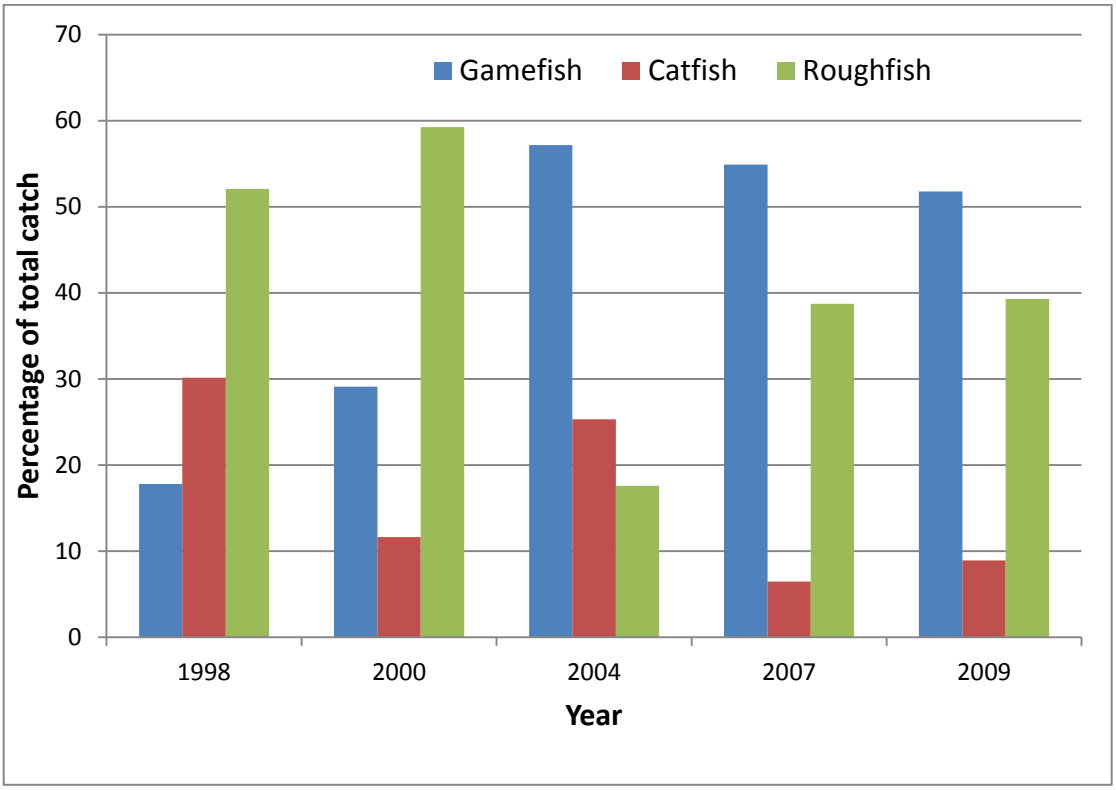

Figure 9. The percentage (by number) of fish species captured by category by year in Indian Creek Lake, Louisiana with standardized gill nets from 1998 through 2009.

HABITAT EVALUATION

Aquatic Vegetation

Hydrilla was discovered in the reservoir in the late 1990's. By 2002, it could be found outward to the 12 foot contour in some locations. Since that time hydrilla has been a constant problem as it has created an access impediment for anglers and recreational boaters. Hydrilla has encroached on the beaches at the Indian Creek recreation area at all three of the designated swimming areas. It also causes access problems for boaters wishing to access the camping area from the water. Booker Fowler Fish Hatchery has had problems with hydrilla blocking the water intake in some years (2010 and 2011). Numerous complaints have been received by home and camp owners around the reservoir. The majority of the shallow water areas and the entire perimeter of the reservoir are matted with hydrilla.

As of August 2012, approximately 50% of the lake was infested with hydrilla. Hydrilla is the only significant problem vegetation. It has colonized out to the 14 foot contour and approximately 1000 acres are infested. There is a fringe of giant cutgrass along 75 % of the shoreline and approximately 100 acres of American lotus. Salvinia, both common and giant, can be found in the reservoir, but are not causing serious problems. Coverage is less than 100 aces. Alligator weed can be found but does not cause problems. It is sprayed incidentally during applications to control salvinia. Giant salvinia has not become problematic at this time.

Triploid grass carp (TGC), when stocked at the appropriate rates, have proven to be effective at controlling submergent vegetation, especially hydrilla. Due to the limited effectiveness of herbicide treatments discussed above and the numerous problems associated with the use of drawdowns, triploid grass carp have been introduced as a control measure. Three thousand (3000) TGC were stocked at 5 locations around the lake on May 11, 2012. The fish were stocked at a rate of 3 fish per vegetated acre and were 8" to 12" in total length (TL). Booker Fowler Fish hatchery stocked an additional five (5) TGC that were 38" TL into the lake on November 15, 2012. Annual vegetation surveys are being conducted each summer (July - August) to determine the success of the TGC in reducing hydrilla growth. Additional TGC stocking may be considered in 3 to 5 years if needed.

Hydrilla is the only significant problem vegetation expected for 2013. Acreage is expected to be close to 1000 acres. Giant salvinia may become more problematic with coverage near 300 acres possible. American lotus is expected to be near 100 acres. It occurs in shallow water areas in scattered patches.

Substrate

Indian Creek Lake has a small watershed which results in very little sedimentation and turbidity flowing into the lake. The majority of the watershed is found within the Kisatchie National Forest and no agricultural farming except silviculture occurs there. The lake bottom substrate consists primarily of coarse and medium grain sands which provide excellent spawning areas for bottom nesting fish such as largemouth bass, crappie and other sunfish species.

Artificial Structure

The Louisiana Department of Wildlife and Fisheries has not placed artificial structure in

Indian Creek Lake. The only manmade structure found in the lake consists of a small number of boat docks and piers, located near Martin Spring's boat ramp on the south end of the lake.

CONDITION IMBALANCE / PROBLEM

There is currently an overabundance of submergent vegetation in Indian Creek. Studies have determined a range of 15-30% coverage of complex cover is considered most desirable for sportfish productivity. Indian Creek vegetation typemap surveys conducted since 2006 have documented the lake with at least 50% vegetation coverage, well above optimal range for a fisheries concerns and angler access.

CORRECTIVE ACTION NEEDED

Indian Creek Lake would benefit from a reduction in submersed aquatic plants. Aquatic vegetation is recognized as beneficial component of the Indian Creek Lake aquatic habitat. Complete eradication of submersed vegetation is not a desirable outcome.

RECOMMENDATIONS

1. Continue aquatic vegetation surveys each summer to determine species composition and coverage of aquatic vegetation. This will provide a method to monitor the success of the TGC stocking and determine if additional vegetation control is necessary.

2. LDWF spray crews will continue treating emergent vegetation several days per month as needed with either glyphosate or diquat and an approved surfactant. These herbicides are applied at the rate of 0.75 gallons per acre with the surfactant applied at 0.25 gallons per acre. A diquat/glyphosate mix may be applied to giant salvinia infestations at a rate of 0.75 gal/acre glyphosate, 0.25 gal/acre diquat, 0.25 gal/acre Aqua King Max, and 8 oz. of Thoroughbred. Alligator weed will be controlled with Imazapyr (0.5 gal/acre) in undeveloped areas and with Clearcast (0.5 gal/acre) near houses and developed shorelines.

3. Continue scheduled standardized fisheries sampling to determine status of sportfish and forage populations.